Supporting Information

Fluorescent nanoparticles in the popular pizza: properties, biodistribution and cytotoxicity

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Methods

Biodistribution of FNPs in Caco-2 Cells

Caco-2 cells were cultured in MEM supplemented with 20% FBS, penicillin (100 U/mL), streptomycin (100 μg/mL) and maintained in an incubator at 37 °C with 5% CO_2 and a humidified atmosphere. Caco-2 cells were trypsinized and seeded in confocal culture dish at an initial cell density of 1 × 104 cells/well. After 24 h in culture, FNPs dissolved in medium was added to the dish at a concentration of 1 mg/mL. Following incubation at 37 °C for 6 h, the cells were washed thoroughly with PBS three times and kept in PBS for imaging using a fluorescence inverted microscope (Eclipse Ti, Nikon, Tokyo, Japan) at 361-387 nm excitation wavelength.

Atomic force microscopy (AFM) characterization

Morphology analysis of the pizza FNPs in different media were carried out in an atomic force microscopy (5500M, Hitachi, Tokyo, Japan). The height profile analysis was analyzed by the 5500 Ⅱ software.

Results

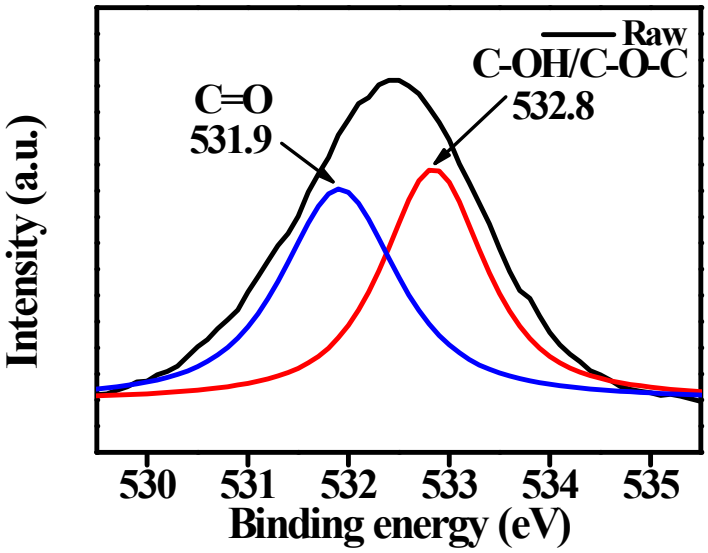

Figure S1. High-resolution XPS spectra of O_{1s} for pizza FNPs.

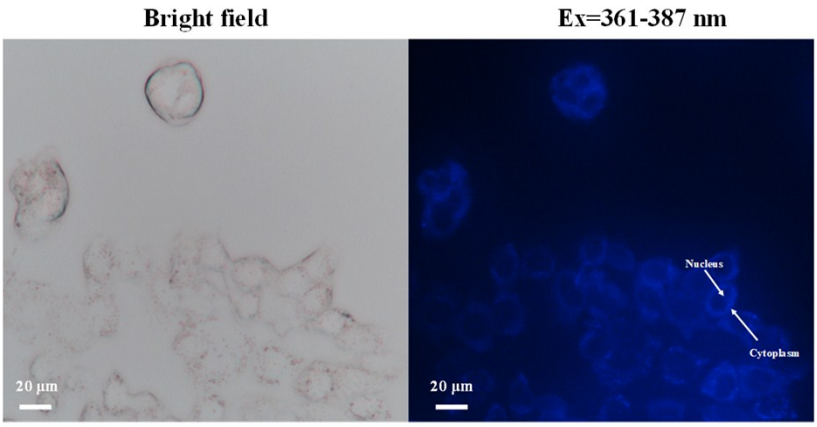

Figure S2. Fluorescent imaging of human gut epithelial (Caco-2) cells incubated with FNPs (1 mg/mL) for 6 h.

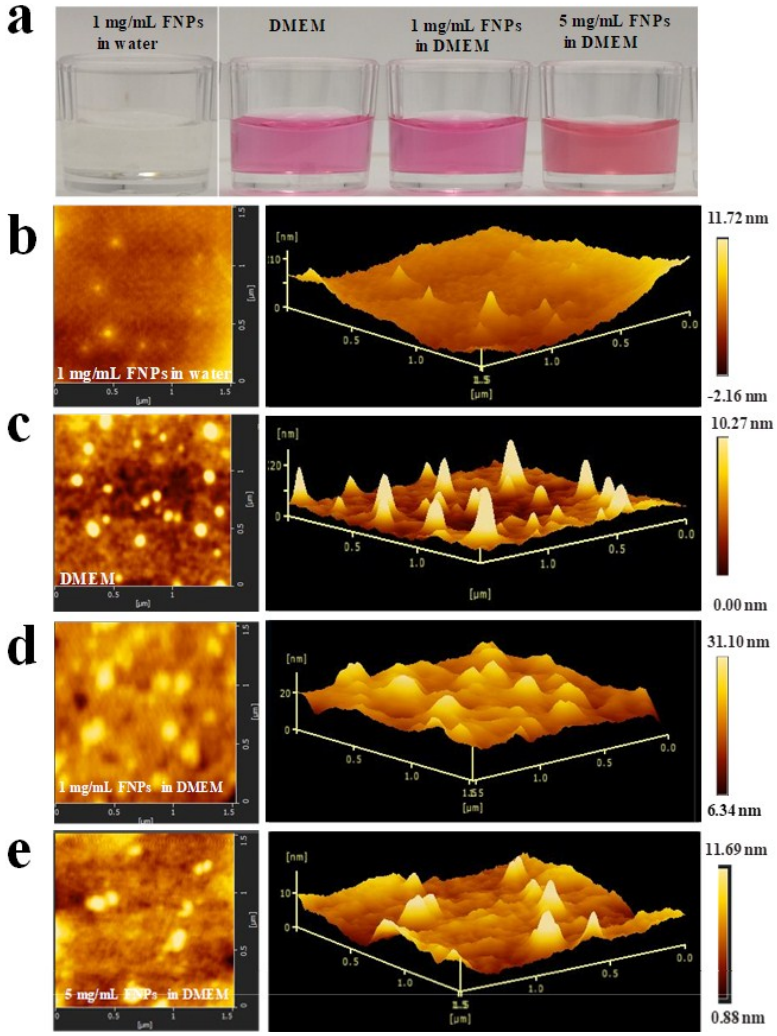

Figure S3. (a) Dispersion of the pizza FNPs in water and DMEM cell culture medium with 10% fetal bovine serum. Atomic force microscopy (AFM) images of (b) FNPs and (c) DMEM cell culture medium with 10% fetal bovine, (d)1 mg/mL, and (e) 5 mg/mL of FNPs in DMEM cell culture medium with 10% fetal bovine.

Table S1 Comparisons between characteristics of FNPs derived from pizza and those of synthetic carbon dots prepared from ingredients of pizza.

Food/Ingredients	Size (nm)	Functional groups	UV (nm)	FL (Ex/Em, nm)	Temperature (°C)/time(min)	Reaction	Reference
Pizza	3.33 ± 0.76	-COOH, -OH, $-NH_2$, -C=O, -C=C	264	330 /401	200/10	Baking	this work
Bread	27.5±6.1	-C=O	~280	~475/---	/	Baking	6
Flour	1-4	-OH, -COOH, $-NH_2$	288	365 /442	150/20	Microwave heating	28
Tomato	3.0 ± 1.3	-COOH, -OH, $-NH_2$, -C=O	/	367 /440	150/120	Hydrothermal reaction	32
Cornflour	3.5	-COOH, -OH, $-NH_2$, -C-O-C, -C=O	282	360 /441	180/300	Hydrothermal reaction	33
Mushroom	2.3 ± 1.3	-COOH, -OH, $-NH_2$, -C=O	285	370 /455	200/360	Hydrothermal reaction	34

Note: FL: fluorescence; Ex: excitation; Em: emission.